H.264 2-Channel DVR

F1-110 / F1-110G

User's Manual

- H.264 2Ch. DVR
- Built-in GPS (F1-110G Model)
- 3-Axis Shock Sensor
- Up to 32G SDHC

※ The contents of the manual can be modified without prior notice to customers

GENERAL SAFETY AND PRECAUTIONS

F1-110 is manufactured to meet international safety standards. Read the following safety precautions to avoid injury and prevent damage to the F1-110 or any products connected to it.

1. Use a correct power source. Do not connect this product to a power source that supplies more than the specified voltage (DC12V), as this will cause damage to the unit.

2. Never insert anything metallic into F1-110 as this can cause electric shock.

3. Do not operate in wet & dusty conditions. Keep product surfaces clean and dry. Avoid placing the F1-110 in areas like a damp basement or a dusty hallway.

4. Do not expose this product to rain or use near water. If the product gets wet, unplug it and contact an authorized dealer immediately.

5. To clean the outside case of the F1-110, use a lightly dampened cloth (no solvents).

6. Do not operate if you suspected unit is faulty. If there are any unusual sounds or smells coming from the F1-110, immediately unplug it and contact an authorized dealer or service centre.

7. Do not attempt to remove the top cover.
   Warning: Removing the DVR's cover can cause an electrical shock.

8. Handle F1-110 carefully to avoid damaging the product. Dropping your F1-110 on any hard surface may cause the unit to malfunction. If the F1-110 does not work properly due to physical damage, contact an authorized dealer for repair or exchange.

9. The unit has a lithium battery preinstalled.
   The standard lithium cell 3V battery located on the motherboard should be replaced if the time clock does not hold its time after the power is turned off.

Warning:
Unplug the F1-110 before replacing battery or you may be subjected to severe electrical shock. Properly dispose of old batteries.

Caution:
Risk of explosion if battery is replaced by an incorrect type. Do not discard lithium batteries into the trash can or into fire. Dispose in accordance with local waste regulations.

TABLE OF CONTENTS

CHAPTER 1: PACKING CONTENTS

CONTENTS IN THE PACKAGE 5

CHAPTER 2: GETTING TO KNOW F1-110

F1-110 6

CHAPTER 3: REMOTE CONTROL

REMOTE CONTROL BUTTON 8

CHAPTER 4: GETTING STARTED

HOW TO INSTALL F1-110 10

CHAPTER 5: HARDWARE INSTALLATION

1. FORMAT SD MEMORY CARD 11
2. INSERT SD MEMORY CARD 11
3. BACKUP RECORDED FILES 11
4. CONNECTING F1-110 TO YOUR TV SET OR MONITOR 11
5. INSTALL IN THE VEHICLE 13
   - 5.1 PARKING MODE
   - 5.2 NORMAL MODE
6. INSTALLATION DIRECTION ACCORDING TO SHOCK SENSOR 14

CHAPTER 6: MENU MODE

MENU TREE 15

1. ACCESS TO MENU MODE 16
2. MAIN MENU 16
3. SYSTEM SETUP 17
   - 3.1 TIME SET > DAY LIGHT SAVING
   - 3.2 Day Light Saving
   - 3.3 TIME OVERLAY
   - 3.4 TIME CORRECTION
     - 3.4.1 HOW TO SETUP TIME CORRECTION
   - 3.5 LANGUAGE SETUP
   - 3.6 VIDEO OUTPUT
   - 3.7 GPS
4. A/V SETUP 18
   - 4.1 RESOLUTION
   - 4.2 VIDEO QUALITY
   - 4.3 FRAME RATE
   - 4.4 BRIGHTNESS
   - 4.5 AUDIO INPUT LEVEL
   - 4.6 REMAINING MEMORY
   - 4.7 CHANNEL SELECT
   - 4.8 PIP

5. RECORDING SETUP 19
5.1 CONTINUOUS RECORDING
5.2 RECORDING BLOCK
5.3 POST-RECORDING TIME
5.4 DISK OVERWRITE

6. EVENT SETUP 20
6.1 SHOCK SENSOR SENSITIVITY
6.2 ALARM INPUT
6.2.1 ALARM CONTINUE
6.3 ALARM OUTPUT
6.4 SCHEDULE SETUP
6.4.1 TIME
6.4.2 EVENT

7. RS-485 21
7.1 RS-485
7.2 RS-485 ID
7.3 RS-485 ID OVERLAY
7.4 BAUDRATE
7.5 PROTOCOL
7.6 KEYBOARD MAPPING

8. SUB MENU 22
8.1 PASSWORD ENABLE
8.1.1 CURRENT PASSWORD
8.1.2 NEW PASSWORD
8.1.3 CONFIRM PASSWORD
8.2 FIRMWARAE UPDATE
8.3 SYSTEM INFORMATION

CHAPTER 7: NAVIGATION BAR

1. SCREEN ICON 23

CHAPTER 8: SEARCH MODE

1. SEARCH FACTOR 26
1.1 SEARCH FACTOR-TIME
1.2 SEARCH FACTOR-EMERGENCY
1.3 SEARCH FACTOR-SHOCK SENSOR
1.4 SEARCH FACTOR-ALARM
1.5 SEARCH FACTOR-SCHEDULE
1.6 SEARCH FACTOR-ALL

2. SEARCH LIST

Appendix:

TECHNICAL SPECIFICATIONS 27

CHAPTER 1: PACKING CONTENTS

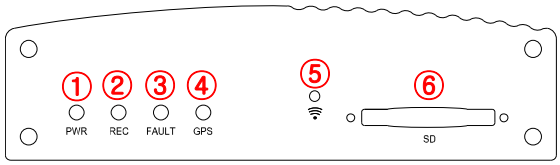
▶ **Contents in the package**

F1-110 Unit	REMOTE CONTROL	INSTALL CD
WIRE HARNESS	GPS ANTENNA (F1-110G Only)	

CHAPTER 2: GETTING TO KNOW F1-110

This chapter briefly describes the functions of each button on F1-110. The buttons are used to operate the basic functions of F1-110, such as recording, playback, fast-forward, reverse play and etc. For more details on the set-up and operation of F1-110, refer to Chapter 6, F1-110 MENU.

FRONT



NO	ITEM	DESCRIPTION
1	**POWER LED**	Red LED lights on when power is on.
2	**REC LED**	Green LED lights on while recording.
3	**FAULT LED**	Yellow LED blinks when error occurs.
4	**GPS LED**	Blue LED blinks while finding GPS signal and lights on when GPS is in 3D fix*. ** 3D fix requires four or more satellites, and provides latitude and longitude.*
5	**IR Receiver**	Point remote control at the IR receiver.
6	**SD MEMORY CARD Slot**	Insert or take out SD memory card.

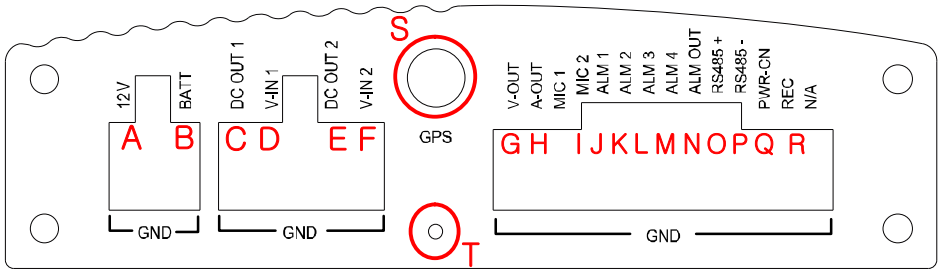
LED Status

Status	PWR	REC	FAULT	GPS
Standby Status on Parking Mode	**5Blink ◑**			
Normal Mode	**ON ●**			
Wakeup Status on Parking Mode	**1Blink ◑**			
Booting		**ON ●**	**ON ●**	**ON ●**
Recording Error *(INSERT SD MEMORY CARD / SD MEMORY CARD LOCKED / SD INVALID FORMAT / SD MEMORY CARD FULL / ETC.)*			**Normal ◑**	
System Error *(INVALID FILE / FILE NOT FOUND / OSD LOAD ERROR / VIDEO DECODER ERROR)*			**Slow ◑**	
Memory Error *(SD MEMORY CARD ERROR / MEMORY ERROR)*			**Fast ◑**	
System Fault *(IRRECOVERABLE HARDWARE ERROR)*			**ON ●**	
On Recording		**ON ●**		
SD Eject		**Slow ◑**		
GPS Not Used / No GPS Data				**OFF ○**
GPS 3D Fix Level 0 / GPS not in 3D Fix				**Slow ◑**
GPS 3D Fix Level 1				**Normal ◑**
GPS 3D Fix Level 2				**Fast ◑**
GPS 3D Fix Level 3				**ON ●**

※ LED Status

- *On / Off / Normal: blink 500msec, Fast: blink 100msec, Slow: Blink 1sec (Interval)*
- *5Blink: 5sec Off → 0.3sec On (repeat) / 1Blink: 1sec Off → 0.3sec On (repeat)*

REAR



NO	ITEM	DESCRIPTION
A	12V	DC 12V Input
B	BATT	12V Car Battery Input
C	DC OUT1	DC Output for Camera1 *(The maximum current consumption and input voltage of the camera connected should be considered)*
D	V-IN1	Video Input for Camera 1
E	DC OUT2	DC Output for Camera 2 *(The maximum current consumption and input voltage of the camera connected should be considered)*
F	V-IN2	Video Input for Camera 2
G	V-OUT	Video Output
H	A-OUT	Audio Output
I	MIC1/2	Audio Input (Microphone) 1/2
J	ALM1	Alarm Input 1
K	ALM2	Alarm Input 2
L	ALM3	Alarm Input 3
M	ALM4	Alarm Input 4
N	ALM OUT	Alarm Output
O	RS485+	RS-485 +
P	RS485-	RS-485 -
Q	PWR-CN	External Power On/Off
R	REC	External Emergency Record
S	GPS	Connect GPS Antenna
T	RESET	System Rebooting (※ Option values are not changed)

CHAPTER 3: REMOTE CONTROL

		POWER	Turn on / off power.
		REC	Start or stop emergency recording.
		EJECT	Stop recording and turn off SD memory card power. *Press eject button before taking out SD memory card from the SD slot.*
		UP/ DOWN	Change values on OSD menu On search mode, find recorded files
		LEFT/ RIGHT	Change values on OSD menu REW : Fast Rewind(X2-X4-X8-X16) FF: Fast Forward(X2-X4-X8-X16)
		ENT	On playback mode, playback at X1 or pause. Select each option value on OSD menu.
		CH1/ CH2	Select display channel.
		SEARCH	Enter & exit search mode.
		MENU	Enter & exit menu mode.
		MODE	Switch between playback mode and live mode.
		GPS	GPS Reset
		VIEW	Navigation bar display ON/OFF
		PIP	Select the size of sub channel: PIP off / QCIF / CIF

		REW	Fast rewind (X2-X4-X8-X16) ※ *Shows only I-frame of the recorded file being played.*
		PAUSE/ PLAYBACK	Pause & playback recorded file at X1.
		FF	Fast forward (X2-X4-X8-X16) ※ *Shows only I-frame of the recorded file being played.*
		STOP	Stop playback (Display the first frame of the playback file).
		MUTE	Remove Audio during playback
	0-9	**NUMBER**	Enter number key when setting up time and etc. on OSD menu.

CHAPTER 4: GETTING STARTED

HOW TO INSTALL F1-110

Below is an overview of the F1-110 installation procedures
(For more detail please refer to Chapter 5 - Hardware Installation.).

(1) Insert a SD memory card into the SD slot.
(2) Connect F1-110 to a TV set or monitor.
(3) Connect camera to F1-110
(4) Connect optional accessories (sensors and alarm-out device)
(5) Connect the power input.
(6) Start monitoring and recording.

General Operating Advice:

- Make sure that a SD memory card is inserted and two cameras are properly connected. (Refer to Chapter 5 -Hardware Installation)
- The SD memory card must be formatted (Refer to Chapter 5 – SD Memory card Installation.) Otherwise, F1-110 may not recognize the SD Memory.
- F1-110 offers you the flexibility to choose a recording frame rate (maximum rate: 30fps / NTSC, 25fps / PAL). The faster the frame rate is, more natural video image output appears from recorded files. However, it requires more SD memory card capacity. You may reduce the frame rate (minimum rate: 1 frame per second) to fit longer recording sessions in consideration of your SD memory card capacity.
- The default values of F1-110 for recording are set up at 30fps (Camera 1)/10fps (Camera 2) with High video quality.
- If shock sensor is triggered while car is parked, F1-110 wakes up on ‘parking mode’ and records accordingly.
- If NTSC and PAL cameras are connected together, F1-110 recognizes this as ‘video loss’.

CHAPTER 5: HARDWARE INSTALLATION

SD memory INSTALLATION

1. Format SD memory card

Insert SD memory card into SD slot in your PC and format it
※ Be sure to format SD memory card in FAT32 or FAT16.
32KB is highly recommended as the default allocation size.
※ If your PC does not have SD slot, use SD memory card reader.
※ Timely formatting the SD memory card and backup the files in it are required to avoid SD memory card error and file loss.
※ Use the original SD memory card only. If not, data loss may happen.
● It is recommended to use original SanDisk SD memory card.

2. Insert SD memory card into the SD slot in F1-110

After formatting, take out SD memory card from your PC and insert it into SD slot on F1-110.
When taking out SD memory card from F1-110 slot, you should press eject button for 1~2 seconds on the remote control.

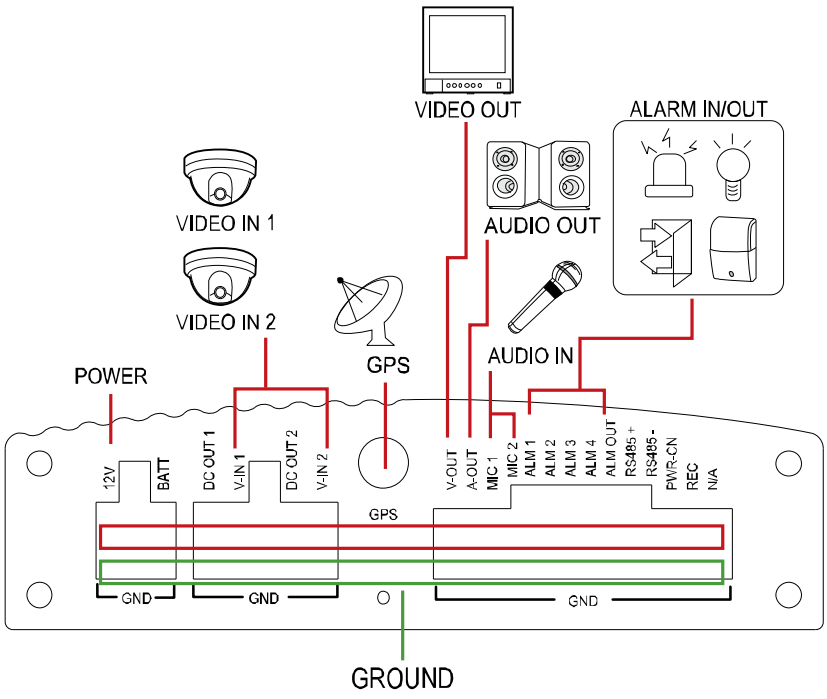
※ Pressing eject button shut the power to SD slot. This status lasts for 3 minutes and is deactivated automatically after 3 minutes. This is deactivated before 3 minutes on the following status; Mode change (Live ⇔ Playback) / Emergency Recording / Removing SD memory card)

3. Backup recorded files in SD memory card

When SD Memory card capacity is full, the recorded files can be backed up in your PC. Insert SD memory card in your PC and move the files in the HDD of your PC. You can also check each recorded file through viewer software.

4. Connecting F1-110 to TV or monitor

① Video Input/Output



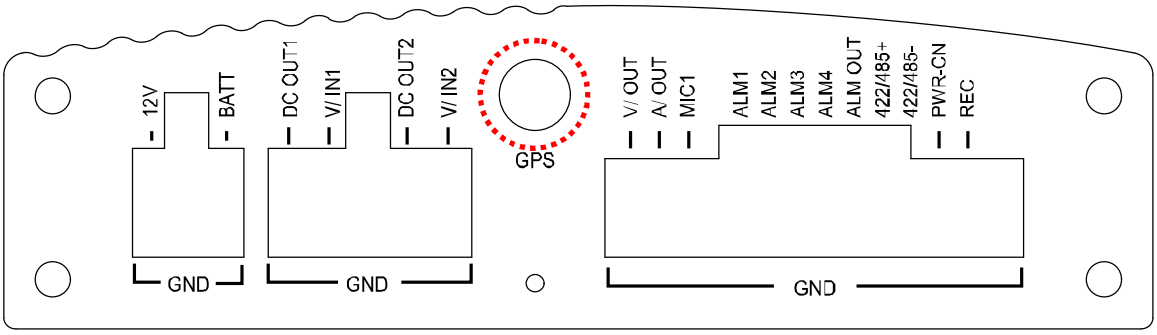
To display images from F1-110, connect the video output port to monitor or TV with appropriate video cable. Any TV with a video input terminal is suitable for displaying the images. The diagram above shows the video signal connections.
Connect the camera to video-in terminal of AV-IN connector; connect the monitor to video-out terminal of AV-OUT connector.

Note: RCA cable required for this connection is not provided with F1-110

② Audio Input/Output Connection (For TV / monitor speaker)

Connect a microphone to audio-in terminal of AV-IN connector and connect the speaker to audio-out terminal of AV-OUT connector.

③ GPS Connection



GPS antenna (F1-110G model) should be connected additionally when you want to use GPS function. Antenna must be placed toward the direction of the sky so that it receives GPS signal well from GPS satellites. F1-110 cannot receive GPS signal well it is placed in the confined spaces such as ‘among tall buildings’ and ‘in tunnels’. It may take long time for F1-110 to receive GPS signal when it is left in ‘power-off’ condition for long term. When it does not find GPS signal, check if the current position is shaded area and reset GPS by pressing GPS button on remote control.

Note: GPS signal reception failure may occur under the following conditions.

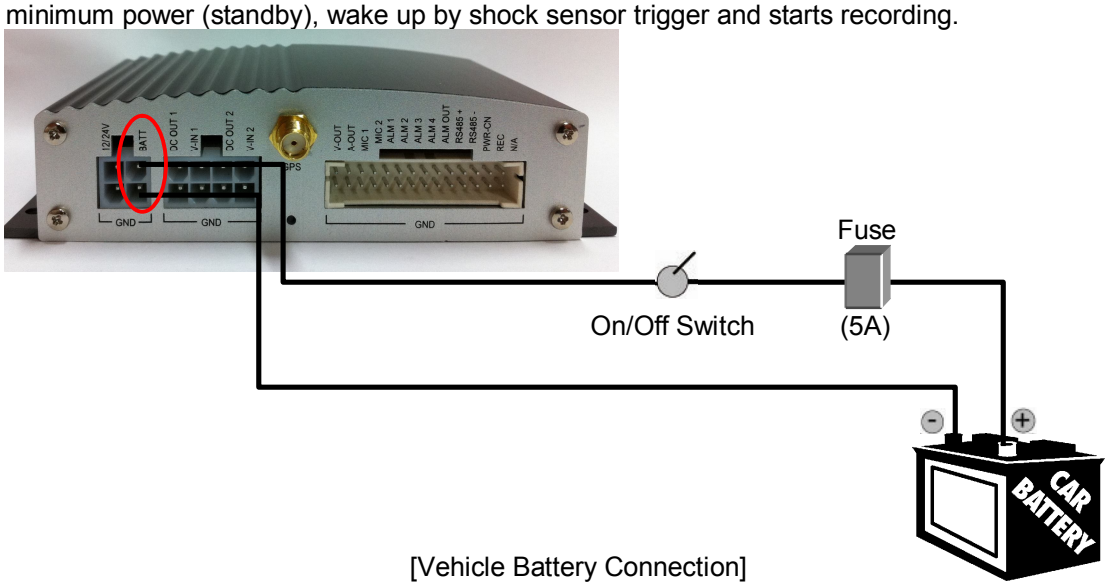
1) An object is placed on the antenna.
2) Windshield is tinted in metal constituent.
3) Install electric device that generates electromagnetic interfering GPS signal inside of vehicle. ex) Remote Start System
4) Cloudy weather
5) Confined spaces; in tunnel, under overpass, in underpass, in underground parking lot, among tall buildings and etc.

※ Electrical device near GPS antenna can interfere GPS data reception. Be sure to place GPS antenna to the appropriate position.

5. Install in Vehicle

5.1 Parking Mode

When a power cable is connected to car battery, parking mode is supported.
While parked with car engine off, F1-110 is not entirely off on parking mode. F1-110 consumes minimum power (standby), wake up by shock sensor trigger and starts recording.



[Vehicle Battery Connection]

Note:

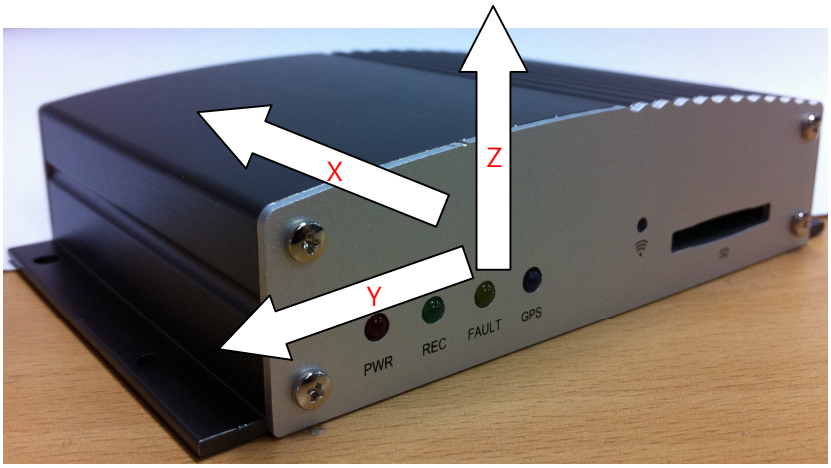
1) ***When the car battery voltage goes down below 12V for 3 minutes, F1-110 is cut off from the power automatically for battery discharge protection.***
2) ***F1-110 on standby wakes up by shock sensor sensitivity level 5.***
3) ***The recorded video is according to the AV setup on OSD menu.***
4) ***Video is recorded in 1fps regardless of AV setup values until SD memory card is initialized on wakeup status of 'parking mode'.***
   This initialization may take 2 ~ 10 seconds according to SD memory card capacity and kinds.

5.2 Normal Mode

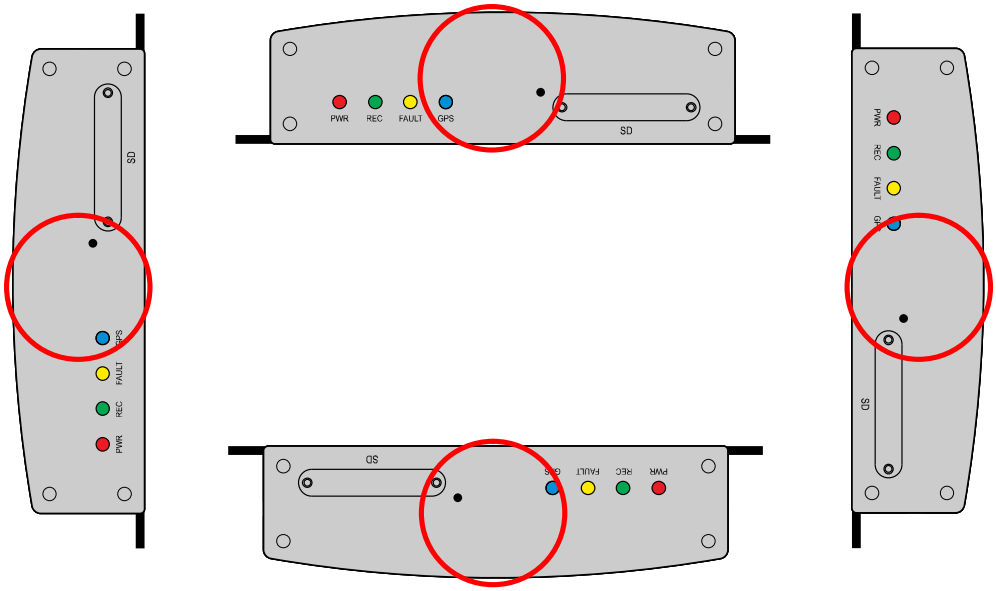
On normal Mode, F1-110 performs recording only when car engine is on. Connect F-110 power to the cigar jack in the vehicle with appropriate cigar jack cable.

Cigar Jack Cable

6. Installation Direction According to Shock Sensor



The direction of 3 axis shock sensor data (x, y, z) is shown as the image above.
Even though installation direction is changed, the shock sensor finds new 3 axis direction according to new direction change.



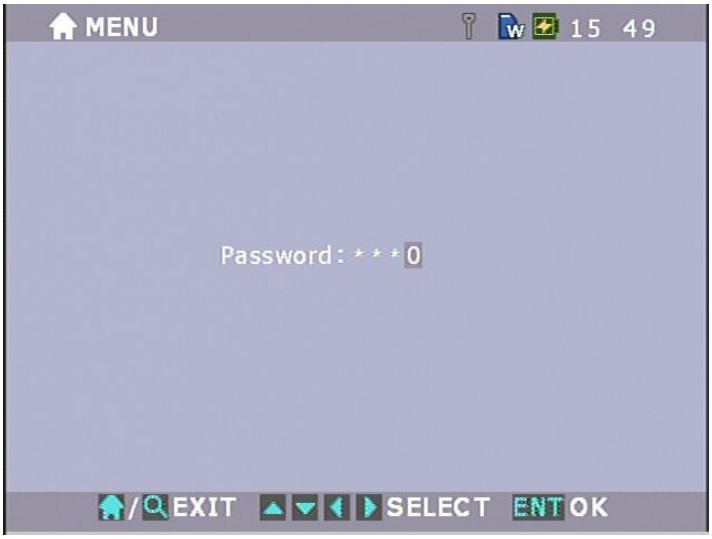
Note: The image shows that the front of DVR is positioned in the opposite direction of vehicle proceeding. If the front of DVR is positioned in the direction of vehicle proceeding, shock sensor data does not stand for accurate values.

CHAPTER 6: MENU MODE

MENU TREE

MENU▷	SYSTEM SETUP▷	TIME SET▷
		DAY LIGHT SAVING▷
		TIME OVERLAY
		TIME CORRECTION
		LANGUAGE
		VIDEO OUTPUT
		GPS
	A/V SETUP▷	RESOLUTION
		VIDEO QUALITY
		FRAME RATE
		BRIGHTNESS
		AUDIO INPUT LEVEL
		REMAINING MEMORY
		DISPLAY CHANNEL
		PIP
	RECORDING SETUP ▷	CONTINUOUS RECORDING
		RECORDING BLOCK
		POST RECORDING TIME
		DISK OVERWRITE
	EVENT SETUP ▷	SHOCK SENSOR SENSIBILITY
		ALARM INPUT▷
		ALARM OUTPUT
		SCHEDULE SETUP▷
	RS-485 ▷	RS-485
		RS-485 ID
		RS-485 ID OVERLAY
		BAUDRATE
		PROTOCOL
	SUB MENU▷	PASSWORD ENABLE
		CURRENT PASSWORD:
		NEW PASSWORD
		CONFIRM PASSWORD
		FW UPDATE
		SYSTEM INFORMATION▷
		Assigned Code
		SW Version
		HW Version

1. ACCESS TO MENU MODE



Press ‘MENU’ button on remote control to access to F1-110 menu mode.
Please refer to ‘Chapter 3: Remote control’ about how to use remote control buttons.
Password is ‘0000’ as default. To change the password, go to **SUB MENU -> PASSWORD ENABLE.**

2. MAIN MENU

On the main menu, when you select each menu by using up and down arrow key on the remote control, selected menu item is highlighted.

3. SYSTEM SETUP

3.1 TIME SET

Set up current local time.

3.2 DAY LIGHT SAVING:

Select 'ON' when you want to apply 'Day Light Saving'. Set up specific period when 'Day Light Saving' is applied.

3.3 TIME OVERLAY

Select 'OFF' when you don't want 'Time and Date' stamp on the screen on LIVE Mode or Playback Mode.

3.4 TIME CORRECTION:

Where there is discrepancy between F1-110 time and actual time, user can correct the discrepant time.

- Time: -999 sec (F1-110 time is ahead of actual time) ~
  +999 sec (F1-110 time is behind the actual time)
- Correction Cycle: Select correction cycle among Day / Week / Month.

※ 'Time Correction' is disabled when GPS is set to 'ON'.

3.4.1 How to Setup Time Correction

① Find the time error: Check how much difference occurs between F1-110 time and actual time.

② Re-setup the time of F1-110 to current time.

③ Enter correction time and cycle.

- When F1-110 time is ahead of actual time: Insert minus value by pressing arrow or number key.
- When F1-110 time is behind the actual time: Insert plus value by pressing arrow or number key.

[Example]

Start time to get time error: 2010/07/05 12:00:00 Finish time to get time error: 2010/07/12 12:00:00 TIME Error: 2010/07/12 12:01:00 Error for 7 days: +60sec	Time Setting: 2010/07/12 12:00:00 Time Correction: -060sec / Week When time correction is applied: 2010/07/19 12:00:00

※ Time correction is not applied on recording even when correction time comes.
On 'emergency recording', recording block generates by 3, 5 or 10 minutes. Time correction is applied when recording block closes on recording.

3.5 LANGUAGE SETUP

Select between English and Japanese

3.6 VIDEO OUTPUT

Display NTSC or PAL according to unit's CCD type

3.7 GPS

Select 'ON' when users want to use GPS function by connection external GPS antenna (F1-110G Model)
F1-110 renews its time system by GPS. (plus or minus 3 second error)

※ ***Coordinated Universal Time*** *(abbreviated* ***UTC****) is the primary time standard by which the world regulates clocks and time.*

4. A/V SETUP

A/V SETUP
15 57
Resolution : 704x480
Video Quality : Highest / Highest
Frame Rate : 30 / 10
Brightness : Normal / Normal
Audio Input Level : 7
Remaining Memory : 289.5MB / 7.4GB
10min 11sec
Display Channel : CH1
PIP : QCIF Size
/ EXIT SELECT ENT OK

4.1 RESOLUTION

Resolution	NTSC	PAL
4CIF	704 x 480	704 x 576
CIF	352 x 240	352 X 288

4.2 VIDEO QUALITY
(HIGHEST / HIGH / NORMAL / LOW / LOWEST): Select desired video level

4.3 FRAME RATE
NTSC: Selectable among 30(10), 15, 10, 3, 1
PAL: Selectable among 25(8), 12, 8, 3, 1

*** Example**

NTSC FRAME RATE -	CHANEL 1:	30	10	15	10	3	1
	CHANEL 2:	10	30	15	10	3	1
PAL FRAME RATE -	CHANEL 1:	25	8	12	8	3	1
	CHANEL 2:	8	25	12	8	3	1

4.4 BRIGHTNESS

Select camera brightness value among low, normal and high.

4.5 AUDIO INPUT LEVEL

User can select from '0' to '10' according to microphone input level. (Default Value: 7)

- 0: Audio Recording Off
- 1: lowering microphone level
- 10: Increasing microphone level

4.6 REMAINING MEMORY

Shows total memory and usable memory including possible recording time.

4.7 CHANNEL SELECT

Setup the display channel for 1 CH/2 CH

4.8 PIP

You can select sub channel size as below. (Default Value: QCIF)

- QCIF (NTSC: 176 X 120, PAL: 176 X 144)
- CIF (NTSC: 352 X 240, PAL: 352 X 288)
- PIP OFF

5. RECORDING SETUP

5.1 CONTINUOUS RECORDING

Recording continues as long as SD memory card is available.

5.2 RECORDING BLOCK

File recorded in terms of 3/5/10 min

- Default Value: 5 min

※ *Regardless of recording block, the number of files is limited to 5,000.*

5.3 POST RECORDING TIME

Post recording time defines how long you will record after an event occurs.

- Default Value: 20 sec
- Range: Min 5 sec ~ Max 180 sec

5.4 DISK OVERWRITE

Disk Overwrite On: When SD memory card capacity is full, F1-110 deletes the file in the order of early recording time and keeps recording with over-writing.

Disk Overwrite Off: Recording stops when the SD memory card capacity is full.

6. EVENT SETUP

EVENT SETUP
16 09
Shock Sensor Sensitivity : 3
Alarm Input
Alarm 1 : N.O/Continue Off
Alarm 2 : N.C/Continue On
Alarm 3 : N.O/Continue Off
Alarm 4 : N.O/Continue Off
Alarm Output : On/N.O
Schedule Setup
1 : MON to SUN 00:00~23:59 Event
2 : MON to SUN 00:00~23:59 Time
3 : Off
4 : Off
/EXIT SELECT ENT OK

6.1 SHOCK SENSOR SENSITIVITY
Setup the shock sensor sensitivity. (Range: off, 1 ~ 5)
- Default Value: 3 (5: Sensitivity High, 1 / Sensitivity Low)
- F1-110 on standby mode wakes up and starts to record by shock sensor sensitivity level 5.

6.2 ALARM INPUT:
Setup ALARM INPUT NO / NC / Off
Select 'NO' or 'NC' according to sensor type for ALARM EVENT RECORDING.
For Alarm Recording, user can setup up to 4 alarms.

6.2.1 Alarm Continue
Select between 'Continue On' and 'Continue Off'. When selecting 'on', recording continues until event stops regardless of post recording time.

6.3 ALARM OUTPUT

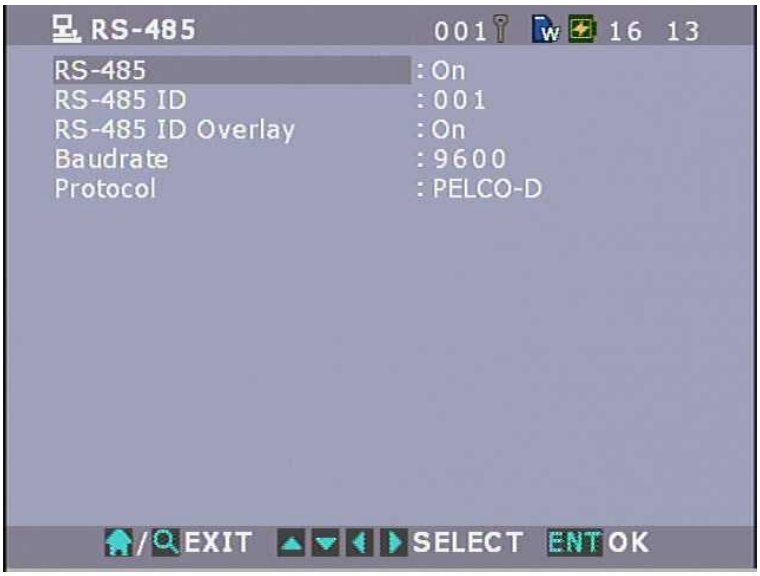
ALARM INPUT	ALARM OUTPUT	
Normal Open	**Normal Open**	Alarm input type is Normal Open. The device connected to alarm output is in 'OFF 'status and turns ON when events occur.
Normal Open	**Normal Close**	Alarm input type is Normal Open. The device connected to alarm output is in 'ON 'status and turns OFF when events occur.
Normal Close	**Normal Open**	Alarm input type is Normal Close. The device connected to alarm output is in 'OFF 'status and turns ON when events occur.
Normal Close	**Normal Close**	Alarm input type is Normal Close. The device connected to alarm output is in 'ON 'status and turns OFF when events occur.

※ Alarm-Out is also activated when shock sensor is detected on standby status of parking mode.

6.4 SCHEDULE SETUP
Setup time for Schedule Recording (Up to 4 different time settings possible)
6.4.1 TIME: Start to record when scheduled time is up.
6.4.2 EVENT: to record when event (triggered by alarm-in device or shock sensor) occurs during scheduled period.

※ Pre-recording time is 5 seconds. F1-110 starts to record 5 seconds before actual event time.

7. RS-485



7.1 RS-485
Select 'Yes' when users want to control F1-110 by keyboard controller.

7.2 RS-485 ID
Assign 3-digit number to F1-110. Default ID is '000'. (0 ~255)

7.3 RS-485 ID Overlay
Select 'Yes' when users want to stamp RS-485-ID on video data and show it on the display on playback.

7.4 Baud Rate
Select from 1200/ 2400/ 4800/ 9600/ 19200/ 38400 according to your keyboard control you wish to connect.

7.5 Protocol
Select between PELCO-D and PELCO-P according to our keyboard control you wish to connect.

7.6 Keyboard Mapping

Key	Function	Key	Function
REC	Iris Open	EJECT	Iris Close
ENT	Zoom In	MENU	Zoom Out
SEARCH	Focus Near	MODE	Focus Far
UP/DOWN ARROW	Tilt Up / Tilt Down	RIGHT/LEFT ARROW	Pan Right / Left
REW	Pan Left	FF	Pan Right
Play / Pause	Zoom In / Zoom Out	CH1	1 + Preset
CH2	2 + Preset	0 ~ 9	100~109 + Preset
Power Off	200 + Preset	GPS	201 + Preset
VIEW	202 + Preset	PIP	203 + Preset
STOP	204 + Preset	MUTE	205 + Preset

8. SUB MENU

8.1 PASSWORD ENABLE

Select 'Yes' means you should enter password when you access to menu mode.
The factory default value is '0000'. Press the number button on the remote control to enter the new password & change the password.

8.1.1 CURRENT PASSWORD: Displays current Password
8.1.2 NEW PASSWORD: Input new Password
8.1.3 CONFIRM PASSWORD: Re-type the new Password for confirmation

8.2 FW UPDATE

Update the F1-110 to latest F/W

8.3 SYSTEM INFORMATION

Displays F1-110's system information:

- Assigned Code : Display assigned code
- SW Version : Displays current SW version
- HW Version : Displays current HW version

CHAPTER 7: NAVIGATION BAR

Navigation bar is displayed on the top and bottom part of the screen as shown in the image below. Various screen icons is shown on the navigation bar on live mode or playback mode.

[Navigation Bar on Playback Mode]

[Navigation Bar on Live Mode]

1. SCREEN ICON

	Live Mode	Displays on Live mode
	Record	Displays on Recording but no file is generated until the icon color turns into red.
	Record	Displays on Recording. A file is generated.

	Playback	Displays on Playback mode
	Menu	Displays when entering Menu Mode
	Search	Displays on entering Search mode
	Disk Overwrite On / Off	Overwrite On: Orange / Overwrite Off: grey
	Remaining Size	Displays the remaining size for recording
	Current Time	Displays the current time
	Day Light Saving	When day light saving mode is applied
	SD MEMORY CARD Exist	Displays when SD MEMORY CARD is inserted
	SD MEMORY CARD LOCK	Displays when SD MEMORY CARD is locked
	SD MEMORY CARD FULL Warning	Displays when SD MEMORY CARD is almost full regardless of overwrite setup. ※Shows when SD memory card has 1 hour recording capacity.
	SD MEMORY CARD INITIALIZING	Displays when SD MEMORY CARD is initializing.
	Invalid SD MEMORY CARD/ SD MEMORY CARD Error	Displays when SD MEMORY CARD is invalid or SD MEMORY CARD error occurs
	SD MEMORY CARD FULL	Displays when SD MEMORY CARD is full ※Shows only when 'overwrite' is set to 'on'.
	No SD MEMORY CARD	Displays when there is no SD MEMORY CARD.
	GPS Not in 3D Fix 3D Fix Level 0 3D Fix Level 1 3D Fix Level 2 3D Fix Level 3	 6.0 < HDOP (Horizontal Dilution of Precision) 4.0 < HDOP < 6.0 2.0 < HDOP < 4.0 HDOP < 2.0
	Supercap	Displays when F1-110 power is connected to DC. green: Supercap charged / grey: Supercap Discharged
	Wakeup	Displays on wakeup status of parking mode.
	CH1	Displays Channel 1 Status yellow: Camera 1 connected / grey: not connected

	CH2	Displays Channel 2 Status yellow: Camera 2 connected / grey: not connected
	Main CH1 or Main CH2	Displays main channel
	Resolution	Displays the current resolution.
	Recording	Displays always on continuous recording
	Emergency Recording	Displays on Emergency recording mode
	Shock Sensor Recording	Displays on recording triggered by shock sensor
	Alarm Recording	Displays on recording triggered by alarm input device
	Schedule Recording	Displays on Schedule Recording mode
	Rewind	Displays when rewinding the recorded files
	Fast Forward	Displays when fast-forward the recorded files
	Playback	Displays when playback the recorded files
	Stop	Displays when stop the playing back the recorded files
	Pause	Displays when pause the playback the recorded files
	Sound	Displays when sound is On or Off on playback mode Sound is off on rewind or fast forward playback.

Chapter 8: SEARCH MODE

1. SEARCH FACTOR

There are nine factors for searching recorded files.

1. TIME
2. EMERGENCY
3. SHOCK SENSOR
4. ALARM
5. SCHEDULE
6. ALL

Select each factor and click “LIST”

1.1SEARCH FACTOR – TIME: Time

Search the recorded files within certain range of time.
Please select the wanted date and time.

1.2 SEARCH FACTOR – EMERGENCY Emergency

: Search the recorded files within Emergency Mode.

1.3 SEARCH FACTOR – SHOCK SENSOR Alarm

: Search the recorded files within Shock Sensor Mode.

1.4 SEARCH FACTOR – ALARM

: Search the recorded files within Alarm 1/2/3/4.

1.5 SEARCH FACTOR – SCHEDULE

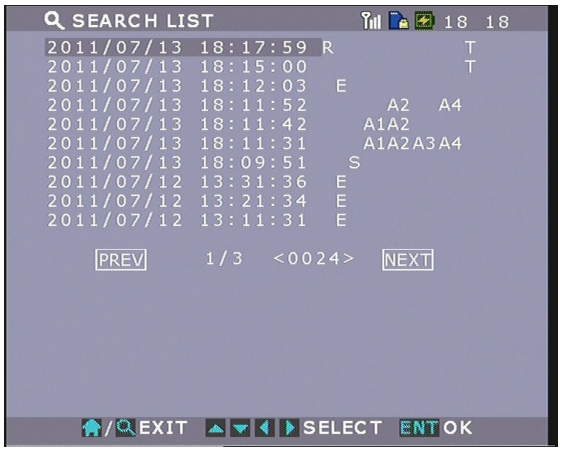
: Search the recorded files within Schedule Recording mode.

1.6 SEARCH FACTOR – ALL

: Search the recorded files within all search factors.

2. SEARCH LIST

When you select search factor and enter appropriate value accordingly, search list result corresponding to search factor and its value is shown as below.



APPENDIX

TECHNICAL SPECIFICATION

ITEM	DESCRIPTION
VIDEO	
Input Channel	2 CHANNEL
Input impedance	75 ohm Unbalanced
Input Format	PAL/NTSC (Auto Detection), Composite
Maximum Input	1.0Vp-p @ 75 Ohm Unbalanced
Output Channel	1 Ch.(PIP Support)
Output impedance	75 ohm Unbalanced
Output Format	PAL/NTSC (according to Input), Composite
Maximum Output	1.0Vp-p @ 75 Ohm Unbalanced
Deinterlace	Perform high quality deinterlacing for arbitrary format of interlaced video input
RECORDING	
Encoding	H.264
File Format	SFR (Proprietary Format)
Video Recording Resolution	

Format	PAL	NTSC
4CIF	704x576	704x480
CIF	352x288	352x240

Video Recording Quality

Qulity	Highest	High	Normal	Low	Lowest
4CIF (kbps)	1700	1700	1500	1200	1100
CIF (kbps)	1400	1400	1100	900	650

Video Recording Frame Rate

NTSC	30/10, 15/15, 10/10, 3/3, 1/1 fps
PAL	25/8, 12/12, 8/8, 3/3, 1/1 fps

Recording MODE	Continuous Recording / Emergency / Schedule / Alarm / Shock-Sensor
Decoding Video Format	As recorded Quality & Frame Rate
Pre-recording Time	Max. 5sec@Normal Mode Recording
Storage	Support SD, SDHC(2~32GB, More than Class4)
Storage File System	FAT16, FAT32(recommended)
Allocation Unit Size`	32Kbytes(recommended) @2GB-32GB SD/SDHC
Maximum Recording File	5,000 files
AUDIO	
Compression Format	8KHz, 16bit Mono PCM
Input Channel	2 Ch. Mono
Input impedance	4.7K ohm typ.
Maximum Input	1.2 Vp_p @ Audio Input Level 1(Menu)
Output Channel	1 Ch. Mono, Unbalanced
Maximum Output	13mW@RL =16ohm, Unbalanced
ALARM	

Input	4 Ch. TTL(Internal pull-up), 40V max.
Output	1 Ch. TTL(Open Drain), 15V max. 500mA max.
OPERATING MODE	
Operating Mode	Normal Mode: Live/Playback/Menu/Search/Record Parking Mode: Record Only
VIEWER SOFTWARE	
Monitoring Environment	Client S/W
File Convert	AVI(Audio video interleaving)
I/O	
I/O	28pin Pluggable Header Connector (Video out 1CH, MIC in 2CH, Speaker out 1CH, Alarm in 4CH, Alarm out 1CH, RS485, Emergency REC, Power Control)
Camera	8pin Pluggable Header Connector (Video input 2CH, Camera power output 2CH)
Power	4pin Pluggable Header Connector (DC input, Battery input)
SD Slot	1Port, SD Card Slot
OTHERS	
LED	4 Status LED (Power, REC, Fault, GPS)
Remote Control	1 IR Receiver
Shock Sensor	3-Axis Shock Detection
POWER	
Input Voltage Range	Main(DC): 10 to 15VDC(@9.5VDC Cut off) Battery: 12 to 15VDC (@12VDC Cut off)
Power Consumption	Normal Mode: Approx. 300mA @ 12VDC (750mA max. initial peak current @ 12VDC) Standby Status on Parking Mode: Approx. 6mA @ 12VDC
Camera Power Output	Input power bypass @ 10 to 15VDC, 900mA max. Power is supplied to camera only on normal and wakeup mode. ※ Caution: Be sure to check camera input voltage range(before connection)
ENVIRONMENTAL	
Operating Temperature	-20 ~ +60 °C
Humidity	30 ~ 80 %RH (non-condensing)
PHYSICAL	
Dimension	120(W) x 78(L) x 29.5(H) mm
Weight	Approx.205g
ACCESSORY	
Remote Control	Supplied
SD Memory Card	Option
GPS Antenna	F1-110G Model Only
I/O Wire Harness	Supplied(Receptacle to wire)
Camera Wire Harness	Supplied(Receptacle to wire)
Power Wire Harness	Supplied(Receptacle to wire)